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EXAMINER	
LERNER, MARTIN	

ART UNIT	PAPER NUMBER
2654	8

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/658,045	Applicant(s) MURASHIMA, ATSUSHI	
	Examiner Martin Lerner	Art Unit 2654	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 23 December 2003 and 08 January 2004.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1 to 19 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1, 2, 5 to 7, 9, and 11 to 19 is/are rejected.

7)☒ Claim(s) 3, 4, 8 and 10 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 06 November 2000 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

2. Claims 1, 2, 5 to 7, 9, 11 to 14, 17, and 18 are rejected under 35 U.S.C. 102(e) as being anticipated by *Jarvinen et al.*

Regarding independent claims 1 and 12, *Jarvinen et al.* discloses a method and apparatus for generating comfort noise by decoding speech, comprising:

"calculating a norm of said excitation signal for each fixed period" – the random excitation gain $g_{cn}(j)$ is computed for each subframe, based on the energy of the LP residual signal of the subframe, according to equation (10); random excitation gain $g_{cn}(j)$ is an average ("norm") of the LSF prediction residual signals $r(n)$ for 39 subframes, normalized by denominator 10 and scaling factor 1.286 (column 24, lines 24 to 40); compare Equation (10) with Page 22, Line 5 of the Specification, which is Applicant's calculation for a "norm"; Merriam-Webster's Dictionary defines a "norm" as an "average";

"smoothing said calculated norm using a norm obtained in a previous period" – the computed random excitation gain values are averaged and updated in the first

subframe of each frame to produce $g_{cn}^{mean}(n)$ according to Equation (11); computed random excitation gain value $g_{cn}^{mean}(n)$ is computed based upon an average of the last six subframe values of random excitation gain $g_{cn}(j)$ ("using a norm obtained in a previous period") (column 24, lines 45 to 63); implicitly, averaging over the last six subframes produces a "smoothing" of the value for random excitation gain value $g_{cn}^{mean}(n)$ for the comfort noise;

"changing amplitude of said excitation signal in said period using said calculated norm and said smoothed norm" – in the decoder, the excitation 212 is formed by first generating the white noise excitation sequence 114 with random excitation generator 110, which is then scaled by g_{mean} in scaling block 115 (column 8, lines 40 to 47: Figure 2b); RESC-parameters drive the RE spectrum control filter 211, which, in combination with the random excitation generator 110, together designated a CN-excitation generator 210, produce an excitation sequence 212, or excitation signal (column 8, line 67 to column 9, line 28: Figure 2b); $g_{cn}^{mean}(n)$ is the "smoothed norm" and is calculated from components of $g_{cn}(j)$, "said calculated norm";

"driving said filter by said excitation signal with the changed amplitude" – synthesis filter 112 receives the white noise sequence from random excitation generator 110, as scaled by g_{mean} in scaling block 115; the spectrally controlled excitation 212 is then used in the speech synthesis filter 112 to produce comfort noise (column 8, line 40 to column 9, line 19: Figure 2b).

Regarding claims 2, 7, and 13, *Jarvinen et al.* discloses residual excitation parameters *r(n)* and LSF parameters *f(i)* are vectors (column 21, line 62 to column 22, line 13; column 23, lines 49 to 63).

Regarding claims 5, 11, and 18, *Jarvinen et al.* discloses a coder produces linear prediction parameters by LPC-analysis 101, and random excitation spectral control (RESC) parameters, r_{mean}, characterize the spectrum of the excitation by a second analysis; $f^{mean}(i)$ represents the LPC parameters ("a linear prediction coefficient") and $r_{mean}(i)$ represents the excitation ("an excitation signal") (column 7, line 56 to column 8, line 5: Figure 2a).

Regarding claims 6 and 14, *Jarvinen et al.* discloses SP flags and VAD flags so that comfort noise is only generated during periods of silence or no-speech; Voice Activity Detector (VAD) 21 determines whether the input signal from microphone 19 contains speech; whenever the VAD flag="1", the speech encoded output frame is passed directly to the radio transmitter 14, marked with the SP flag="1"; at the end of a speech burst, the transmitter marks the frame with the SP flag="0" (column 21, lines 8 to 45: Figures 12, 14, and 15); comfort noise is generated over an averaging period for consecutive frames marked with VAD="0" (column 22, lines 30 to 38).

Regarding claim 9, *Jarvinen et al.* discloses SP flags and VAD flags so that comfort noise is only generated during periods of silence or no-speech; Voice Activity Detector (VAD) 21 determines whether the input signal from microphone 19 contains speech; whenever the VAD flag="1", the speech encoded output frame is passed directly to the radio transmitter 14, marked with the SP flag="1"; at the end of a speech

burst, the transmitter marks the frame with the SP flag="0" (column 21, lines 8 to 45: Figures 12, 14, and 15); comfort noise is generated over an averaging period for consecutive frames marked with VAD="0" (column 22, lines 30 to 38); identifying whether the frame is speech or silence according to the value of the transmitted SP flags and VAD flags corresponds to a "nature of said received signal in said noise period is identified based on said decoded information"; computing $g_{cn}^{mean}(n)$ only for frames marked with VAD="0" corresponds to "processing contents at said smoothing step are selected based on said identified nature."

Regarding claim 17, *Jarvinen et al.* discloses VAD flags and SP flags produce comfort noise with a random excitation gain only during periods of silence; thus, flags act as a switch to calculate excitation for comfort noise during periods of silence with Equation (11), and to calculate excitation for periods of speech via synthesis filter 112 in the ordinary way (column 7, line 56 to column 8, line 5; column 8, lines 41 to 47; column 22, lines 30 to 38: Figures 2a and 2b).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 15, 16, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Jarvinen et al.* in view of *Johnson*.

Regarding claim 15, *Jarvinen et al.* classifies the nature of the received signal in the noise period using decoded information from the VAD flags and SP flags. (Column 21, Lines 8 to 45: Figures 12, 14, and 15) However, *Jarvinen et al.* omits a smoothing circuit including a plurality of smoothing filters with characteristics different from one another, where one of the said smoothing filters is selected in accordance with the identified nature.

Johnson teaches a method and apparatus for enhancing noise-corrupted speech, where a spectral smoothing module 22, referred to as a smoothed Wiener filter (SWF), controls the size of a window with which a Wiener filter filters noise-corrupted speech. VAD 20 outputs one of integers 0, 1, 2, and 3 indicating the speech state of the current frame, as designating states of "Silence", "Primary Detect", "Speech, and "Hang Over," respectively. A larger size of the smoothing window enables SWF module 22 to efficiently smooth out the spikes in the noise spectrum, which are most likely due to random variations. On the other hand, when the current state is not the Silence state, then the SWF modules 22 utilizes a smaller size of the smoothing window, which preserves spectrum information. The VAD 20 may switch filters having four different widths based on the likelihood of the speech existence. (Column 10, Line 23 to Column 11, Line 11: Figures 1 and 2)

It is suggested this method and apparatus has the advantage of improving the speech quality of a noise suppression system by reducing the variance of the noise-corrupted signal when only noise exists and enhancing intelligibility. (Column 4, Lines 41 to 64) Switching the window length of the smoothed Wiener filter of *Johnson* is

equivalent to "a plurality of smoothing filters with characteristics different from one another". It would have been obvious to one having ordinary skill in the art to include the plurality of smoothed Wiener filters of *Johnson* in the method and apparatus for generating comfort noise of *Jarvinen et al.* for the purpose of improving speech quality and enhancing intelligibility.

Regarding claim 16, *Jarvinen et al.* discloses residual excitation *r(n)* and LSF parameters *f(i)* are vectors (column 21, line 62 to column 22, line 13; column 23, lines 49 to 63).

Regarding claim 19, *Jarvinen et al.* discloses a coder produces linear prediction parameters by LPC-analysis 101, and random excitation spectral control (RESC) parameters, r_{mean}, characterize the spectrum of the excitation by a second analysis; $f^{mean}(i)$ represents the LPC parameters ("a linear prediction coefficient") and $r_{mean}(i)$ represents the excitation ("an excitation signal") (column 7, line 56 to column 8, line 5: Figure 2a).

Allowable Subject Matter

5. Claims 3, 4, 8, and 10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

6. Applicant's arguments filed 23 December 2003 and 08 January 2004 have been fully considered but they are not persuasive.

Applicant argues *Jarvinen et al.* fails to anticipate the claims under 35 U.S.C. § 102(e) because the reference does not disclose the limitation of changing the amplitude of the excitation signal using a calculated norm and a smoothed mean. Applicant says the signal that is used is generated by a random excitation generator in *Jarvinen et al.*, but the signal that is used is not the excitation signal and information on linear prediction coefficient from a received signal. Therefore, Applicant submits that the excitation signal whose amplitude is changed using the calculated and the smoothed norm is not the signal output by the random excitation generator in *Jarvinen et al.* This position is traversed.

Jarvinen et al. discloses a method for generating comfort noise during periods of silence, where the excitation signal represents only comfort noise. Figure 2b illustrates a decoder on the receive side that is used to generate comfort noise. The decoder receives a signal from the encoder that includes RESC parameters $r_{mean}(i)$, defining a set of filter coefficients b(i). The RESC parameters $r_{mean}(i)$ and filter coefficients b(i) are "information on a linear prediction coefficient from a received signal". That is, the RESC parameters $r_{mean}(i)$, and the filter coefficients b(i) derived therefrom, are produced in the encoder by random excitation (RE) LPC-analysis. (Column 7, Line 56 to Column 8, Line 67) These parameters are sent to the decoder to drive the RE spectrum control

filter 211, which, in combination with the random excitation generator 110 -- together designated a CN-excitation generator 210 -- produce an excitation sequence 212, or excitation signal. (Column 8, Line 67 to Column 9, Line 28) Thus, *Jarvinen et al.* generates the excitation signal in the decoder by CN-excitation generator 210 from received linear prediction information, not solely as a white noise excitation sequence 114 by random excitation generator 110, as contended by Applicant.

Jarvinen et al. generates comfort noise with a CN-excitation generator, as during periods of silence, or background noise only, the signal can be modeled mainly by white noise as there is little or no speech component. Applicant's implication is that because *Jarvinen et al.* uses only a random excitation generator, equivalent to a noise codebook, but not a adaptive codebook for a speech component, there is no excitation signal. However, those having ordinary skill in the art know the definition of an excitation signal in speech processing generally consists of a summation of both a speech component and a noise component. During signal transmission, there are times when the speech component predominates and times when the noise component predominates. The signal still is called an excitation signal even though only noise (background or silence) is transmitted during periods when nobody is speaking. Thus, the CN-excitation generator of *Jarvinen et al.* does produce an excitation signal even though the only output is comfort noise.

Applicant also argues that the device disclosed by *Jarvinen et al.* is unlike Applicant's claimed device because the reference cannot reduce the temporal fluctuation in the input signal to the synthesis filter. Applicant says *Jarvinen et al.*

assumes the signal is white noise and calculates the gain from an LP residual signal. However, Applicant maintains, in the case of general signals, that if the gain is calculated without considering the excitation, then it is necessary to reduce the temporal fluctuation. Applicant apparently admits the problem of temporal fluctuation would not be present in *Jarvinen et al.* because the reference is only concerned with signals that are background noise, but that *Jarvinen et al.* does not account for temporal fluctuation if the signal is speech. This position is traversed.

Applicant's argument can only be construed as in the nature of unexpected results, but such an argument is not relevant to an anticipation rejection. The claims do not expressly say anything about temporal fluctuations. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Thus, the argument does not overcome the rejection of claims 1, 2, 5 to 7, 9, 11 to 14, 17, and 18 under 35 U.S.C. 102(e) as being anticipated by *Jarvinen et al.*

More generally, the argument does not overcome a rejection based upon obviousness because there is nothing in either Applicant's claims or Applicant's Specification suggesting improvements with respect to temporal fluctuation. One having ordinary skill in the art would expect that the smoothing of *Jarvinen et al.* would, *per se*, act to reduce temporal fluctuation. Moreover, Applicant's Summary of the Invention, Pages 15 to 18, repeatedly suggests the object of improving sound quality in a noise period. Thus, although *Jarvinen et al.* may not account for temporal fluctuations

during periods of speech, neither would Applicant's disclosed invention, which is also concerned mainly with noise periods.

Therefore, the rejections of claims 1, 2, 5 to 7, 9, 11 to 14, 17, and 18 under 35 U.S.C. 102(e) as being anticipated by *Jarvinen et al.*, and of claims 15, 16, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Jarvinen et al.* in view of *Johnson*, are proper.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin Lerner whose telephone number is (703) 308-9064. The examiner can normally be reached on 8:30 AM to 6:00 PM Monday to Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on (703) 305-9645. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4700.

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3/2/04

RICHEMOND DORVIL
SUPERVISORY PATENT EXAMINER